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ABSTRACTS



1. Assessing the Effects of Native Plants to Slope Stabilization in Road Embankments: A Case Study in Siyahkal Forest, Northern Iran

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ABSTRACT: Soil bioengineering is the low-cost way for slope stabilization in forest roads. Considering economic efficiency, the focus of the present study was to reduce environmentally destructive effects of roads by finding out the appropriate native plants for bio stabilizing slopes and also aiming at providing soil bioengineering decision making skills. The research was carried out through 30 systematic randomly distributed plots at two slope classes. In each sample plot, geological features (slope steepness, aspect and altitude) and various plant species were recorded. Three extra sample plots were taken in upland slopes to illustrate the success and failure of vegetation's presence. Geographical plan showed that roads were located at three land types where total existing land types were five. In total, five cores with 30 cm in diameter and 60 cm in depth created for laboratory tests of soil mechanical characteristics (liquid limit, solid limit and texture). Results revealed that there is a relation between plant species and variables such as land type, soil moisture, soil texture, aspect, slope, and soil depth of study area. The dominant tree species in the study area were *Carpinus betulus* with 24.5% followed by *Parrotia persica* with 17.3% which was followed by *Quercus castaneifolia* (11.7 %), *Fagus orientalis* (8.2%), and *Alnus subcordata* (7.9%). Land type (A) is suitable for road structure, (B) is not suitable for road structure and (C) is relatively suitable for road structure.

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2. Weekly pan evaporation estimation by Stephens-Stewart and Griffith models

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ABSTRACT : Stephens-Stewart model (SSM), and Griffith's model (GM) were used to estimate the weekly pan evaporation (EPW) at Pantnagar, located at the foothills of Himalayas in the Uttarakhand state of India. Weekly meteorological data of maximum and minimum air temperatures, relative humidity in the morning (7 AM) and afternoon (2 PM), wind speed, sunshine hours and pan evaporation from January 2004 to December 2007 were used. The best combination of input variables models were decided using the Gamma Test (GT). The estimated values of EPW by the Stephens-Stewart and Griffith's model were compared with observed values of EPW based on statistical indices such as root mean squared error (RMSE), coefficient of efficiency (CE) and correlation coefficient (r).

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3. Plant environmental variables studies in Jamun cv. Goma Priyanka

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ABSTRACT : A definite increasing trend for carboxylation efficiency of Jamun plants was observed from March to October months followed by a reduction in photosynthetic rates during November and December months. Stomatal conductance and relative humidity percentage of Jamun leaves were low before monsoon months followed by a sharp increase from July to September months. Transpiration rates were found correspondingly

high during June to August months and exhibited a positive correlation with leaf temperature. Vapour pressure deficit values of Jamun leaves were found positively correlated with leaf temperature and were at higher end during May, June and July months. From the experiment, it appeared characteristically that the leathery leaves of Jamun had lower transpiration rates during March to June months. Further, during this period the plant manifested maximum water use efficiency. It indicates better survivability of plants under acute water scarcity which is hallmark of arid and semi arid conditions. It can be utilized as potential underutilized fruit which holds promise for the future in view of adding diversity to fruit basket of the country.

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4. Study on Genetic Variability and Character Inter-Relationship of Quality and Yield Components in Tomato (*Solanum lycopersicum* L.)

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ABSTRACT : The present investigation was conducted to elucidate the genetic characters viz. variability, heritability and correlation between yield and yield components of different tomato (*Solanum lycopersicum* L.) genotypes. Thirty genotypes including released varieties, land races and germplasms were used in this investigation for assessment of quality, yield and yield components. The experiment was conducted during summer, 2012-13 at field of Department Vegetable Science, KRC College of Horticulture, Arabhavi, Karnataka. The study revealed that high heritability coupled with high genetic advance over per cent mean were noticed for number of clusters per plant, number of branches per plant, number of locules per fruit, average fruit weight, equatorial and polar diameter of fruit, lycopene content and fruit firmness, which might be assigned to additive gene effect, selection for such characters gives more importance in crop improvement of tomato. The phenotypic coefficient of variation (PCV) were higher with smaller magnitude than genotypic coefficient of variation (GCV), indicating the apparent variation is not only due to genotypic but also due to influence of environmental factors. The character association analysis indicated that fruit yield were significantly and positively correlated with fruit yield per plant (0.81), number of fruits per plant (0.65) and average fruit weight (0.45), whereas, number of fruits per cluster (-0.15), TSS (-0.04), polar diameter (-0.34) and equatorial diameter (-0.30) were negatively correlated with total yield.

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5. Physio-Biochemical Studies on Thirty Genotypes of Potato (*Solanum tuberosum* L.)

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ABSTRACT: Significant mean squares during two years were observed for leaf area, dry matter content, total chlorophyll content and protein content in tuber exhibiting differential performance of genotypes over different environments. Mean performance of genotypes pooled over two years indicated superiority of Kufri Chipsona-1, J/93-139, Kufri Chipsona-2, J/95-229, J/96-17 and Kufri Anand for tuber yield (480.38, 461.50, 437.38, 431.88, 428.13 and 423.88 q/ha, respectively). Number of tubers per hill was highest in Kufri Pushkar (8.84), JW-160 (8.54) and Kufri Chipsona-1 (8.38). Genotypes exhibiting high values of number of stolon per hill were Kufri Chipsona-1 (19.39), J/95-158 (17.94) and J/96-80 (17.79). Genotypes J/95-80 (90.84g) and J/96-171 (90.67g) exhibited better tuber weight. Genotype PS/96-14 had maximum number of leaves per shoot (18.94) whereas, maximum leaf area occurred in J/96-171 (181.09 cm²). Dry matter content was maximum in Kufri Chipsona-2 (23.55%) followed by Kufri Chipsona-1 (23.22%). Ascorbic acid was found highest in Kufri Bahar (27.18 mg/100g fresh wt.) followed by Kufri Jyoti (26.48 mg/100g fresh wt.). Protein content was maximum in J/95-144 (1.91%) and Kufri Jawahar (1.86%). TSS content was highest in J/93-139 and Kufri Pukhraj (1.59 followed by Kufri Chipsona 2 (1.57 mg) and J/95-221, J-95-80 and J/96-80 (1.56 mg each) J/92-159 (7.39 °B) followed by Kufri Chipsona-1 (7.27 °B) and J/95-242 (7.25 °B). Total chlorophyll content was highest in J/95-80 and Kufri Pukhraj (1.59 mg/g fresh wt.).

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6. Correlation and Path Analysis in Okra [*Abelmoschus esculentus* (L.) Moench]*

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ABSTRACT : Forty five okra genotypes were evaluated in randomized complete block design with two replications. Twenty morphological characters were measured on randomly selected plants for the analysis of correlation and path analysis. Fruit yield per plant showed highly significant and positive correlation with fruit yield per plot and fruit yield per hectare. Fruit yield per plant showed highly significant negative correlation with average fruit weight. Fruit yield per plant showed indirect positive effect via plant height at 45 days after sowing (DAS) and internodal length at 90 DAS. Fruit yield per plant showed significant and negative indirect effect via number of fruits per plant and number of leaves per plant at 45 DAS.

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7. Response of Chilli (*Capsicum annuum* L.) Genotypes with Respect to Different Concentrations of 2, 4-D

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ABSTRACT : The present investigation, carried out during spring-summer season of 2009-10 at Vegetable Research Centre of G.B. Pant University of Agriculture and Technology, Pantnagar, was aimed to optimize the dose of 2, 4-D used as a plant growth regulator in chilli to find out suitable genotypes assessing the variability of chilli crop occurred in India for cultivating in *tarai* region of Uttarakhand. The experiment was laid out in a Split Plot Design with three replications where the three levels of 2, 4-D i.e. 0, 2 and 4 ppm were applied in main plots and the 27 genotypes allotted to each main plot as subplot factor in each replication. The observations were recorded for growth and yield attributes viz. plant height, number of primary branches/ plant, fruit length, weight of fruits/plant, number of fruits/plant and fruit yield/ha. Among all the genotypes PC-7, PC-2064, PC-6, PC-4, and CCHO-5-8 performed better for growth and yield attributes and also produced significantly highest fruit yield (325.0, 270.0, 246.3, 246.3 and 240.9 q/ha, respectively) with application of 2, 4-D @ 4ppm . The results showed that 2,4-D @ 4 ppm had marked influence on growth and yield of chilli, followed by 2,4-D @2ppm produced highest fruit yield than check. Significant differences were also observed for genotypes and their interactions in respect of 2, 4-D for all the attributes.

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8. Effect of Different Embedding Media and Duration of Drying on Production of Quality Dry Flowers in Gerbera (*Gerbera jamesonii* Bolus ex. Hooker F)

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ABSTRACT : Investigation was carried out to standardize the suitable embedding media and drying duration for dehydration of gerbera (*Gerbera jamesonii* Bolus ex. Hooker F) flowers. Fully opened flowers were embedded in four drying media (Coarse Silica Gel, Fine Silica Gel, Coarse Sand and Fine Sand) and dried in four drying durations (12 hours, 18 hours, 24 hours and 30 hours) at constant drying temperature (45°C) in hot air oven. Dried samples were given subjective scores on average 10 points scale with reference to ornamental values comparable to fresh samples on the basis of colour, texture and shape. Among different drying media, the decrease in weight of gerbera flower was highest (67.15 %) by embedding in Fine Silica Gel (FSG) in hot air oven for 30 hours. Effect of drying on colour (8.35), texture (8.00) and shape (8.00) were recorded highest score in hot air oven drying when embedded in Fine Silica Gel. In regardless of all the parameters, the flowers dehydrated by embedding in Fine Silica Gel for 12 hours in hot air oven at 45° C were found to be of best quality.

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9. Correlation and Path Coefficient Analysis of Yield Components in Okra [*Abelmoschus esculentus* (L.) Moench]

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ABSTRACT : Phenotypic correlation and path coefficient analysis was worked out for eleven important characters in fifty genotypes of okra. The estimates of genotypic correlation coefficient were higher than the estimates of phenotypic correlation coefficient for all the character combinations. Fruit yield per plant (g) showed positive and significant correlation with number of first fruiting nodes / plant, final plant height (cm), no. of fruiting nodes /plant, length of fruit (cm), weight per fruit (g), and number of fruits per plant. The path coefficient analysis revealed that the magnitude of direct effect were higher for weight per fruit (0.506) followed by number of fruits per plant(0.326), length of fruit (0.2) and no. of first fruiting nodes /plant (0.190) while the magnitude of rest of the characters in all the environments were moderate to low. Further the indirect effect through weight per fruit and number of fruits per plant were important. Hence it is suggested that more emphasis should be given on weight per fruit, number of fruits per plant and plant height while executing the selection for genetic enhancement of fruit yield in okra.

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10. Effect of Plant Geometry And Nutrition On The Growth Attributes of Okra [*Abelmoschus esculentus* (L.) Moench] cv. Pusa SAWANI

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ABSTRACT : The investigations were carried out with an objective to asses the effect of plant geometry and nutrition on the growth attributes of Okra [*Abelmoschus esculentus* (L.) Moench] at the Department of Horticulture, C.S.A.U.A. & T., Kanpur during rainy season of two consecutive years. The experiment comprised of four levels of nitrogen (0,60, 90 and 120 Kg ha⁻¹), three levels of phosphorus (0,60 and 90 Kg ha⁻¹) and two levels of plant spacing (30 x 40 and 40 x 40 cm) in Factorial Randomized Block Design with three replications Application of 120 kg nitrogen ha⁻¹ caused to produce highest plant height (118.73 and 127.26 cm), number of leaves/plant (16.64 and 17.98), diameter of main shoot (2.38 and 2.46 cm), number of nodes per plant (14.88 and 16.79), fresh weight per plant (153.47 and 155.80 g), and dry matter percentage (22.71 and 17.83%), whereas 90 Kg N ha⁻¹ revealed highest leaf area per plant (784.13 and 795.12 cm²) and control (N₀) showed maximum dry weight percentage (24.09 and 19.65%) during both years of trials. Phosphorus @ 90 kg ha⁻¹ showed highest plant height (112.93 and 117.94 cm), number of green leaves per plant (13.12 and 14.40), number of nodes per plant (12.22 and 14.05), diameters of main shoot (1.93 and 2.02 cm), leaf area (784.85 and 795.43 cm²) and fresh weight per plant (149.55 and 151.51 g), but highest dry matter percentage 27.79% and 18.65% were found in 0 kg phosphorus ha⁻¹ in first year and 60 kg phosphorus ha⁻¹ during second year of investigation. 40 x 40 cm spacing caused to show highest plant height (112.39 and 117.33 cm), number of green leaves (12.27 and 13.36), number of nodes per plant (11.48 and 13.40), diameter of main shoot (1.91 and 1.98 cm), leaf area per plant (753.37 and 764.72 cm²), fresh weight per plant (145.19 and 147.36 g) and dry matter percentage (24.99 and 18.44%) during both the years.

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11. Effect of kinetin on Protein Content of *Euryale ferox* Salisb (Makhana) During Fruit Development

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ABSTRACT : *Euryale ferox* Salisb, also known as fox nut, Makhana or gorgon nut, is the member of the family Nymphaeaceae. Fresh weight and dry weight as well quantitative and protein changes in the developing Makhana seeds and pericarp were described from 12 days after flowering until maturity. The results revealed that in immature fruit, the seeds were more proteinaceous in the control condition reaching up to an average of

25.03days followed by 0.0001% kinetin in the perisperm. In the controlled conditions, the development of pericarp and seeds were normal and gradually increased in the mature stage, while in the over- mature stage it just multiplied twice the rate of protein development. Of all the stages, it was observed that 0.01% Kinetin was more ideal for seed as well as for pericarp development as there is no drop out in the increasing protein concentration during each successive stage of development.

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12. Physiological and Yield Parameters of Multiplier Onion (*allium cepa* l. var *aggregatum* don.) var. CO(On)₅ as Influenced by Zinc and Boron Aapplication

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ABSTRACT : The field experiment was carried out in the College Orchard, Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu during 2013 - 2014 to study the effect of zinc and boron on seedling transplanting of multiplier onion CO(On)₅ at different levels of both foliar and basal application. The eleven treatments consisted of different combination of the soil and foliar application of zinc sulphate as zinc source and borax as boron source replicated thrice in a randomized block design. The foliar spray was given 30 and 45 days after transplanting for both zinc sulphate and borax. Nitrogen, Phosphorus, Potassium, and Sulphur were applied @ 90-60-60-20 kg ha⁻¹, respectively as basal dose. Results were found to be significant in most of the physiological and yield contributing parameters of multiplier onion. The total chlorophyll content (1.38 mg 100 g⁻¹), total dry matter production (5.31 t ha⁻¹) and bulb yield per hectare (16.9 t ha⁻¹) were highest in zinc sulphate by 0.5% foliar spray. The highest benefit : cost ratio (2.08) was recorded in T₃ (zinc sulphate foliar spray @ 0.5 % at 30 and 45 DAT).

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13. Exploration of Ginger (*Zingiber Officinale* rosc.) Cultivation : A Review

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ABSTRACT : Ginger (*Zingiber officinale* Rosc.) is one of the important spice crop of Asia. India is one of the largest ginger producing country in the world. It is valued for its aroma, flavour and medicinal properties. In India, Kerala, Tamil Nadu and Andhra Pradesh are the major states producing ginger. The productivity of ginger remains low in India due to constraints like diseases and improper management. There is a need to standardize the production technology which may help to improve the yield, quality so as to extend the farmers' hand of reliability so that they can get high net returns per unit area. The present review is focused on production practices of ginger.

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14. Performenece of Pea (*Pisum Sativum* L.) Genotypes under Valley Condition of Garhwal Himalayan Region

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ABSTRACT : The study was conducted at Horticultural Research Centre, H.N.B. Garhwal University, Srinagar-Garhwal, Uttarakhand, during rabi season 2013-14 to evaluate the performance of 12 genotypes of pea for quantitative and qualitative traits under valley condition of Garhwal Himalayan region. Among 13 quantitative and qualitative characters studied, maximum plant height was observed in Rachana (168.2 cm) followed by DMR-70 (156.53 cm). Earliest appearance of first flower was observed in DDR-25 (54.66 days) followed by P-1544 (56.33). The earliest green pod harvest (112.66 days) was observed in DMR-70. Maximum length of pod was recorded in P-1544 (10.19cm), maximum number of pods per plant (56.86) was recorded in

Rachana, maximum pod yield (147.43 g/plant) was noted in PSM-32, 100 seed weight was maximum (20.22g) in DDR-62, maximum shelling percentage was recorded in DDR-62 (52.04%), and maximum protein content (9.76%) was recorded in Pusa Pragati .

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15. Gloriosa superba L. : An Endangered Medicinal Plant

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ABSTRACT : Medicinal plants constitute an important natural wealth of the country. These are important sources of therapeutic agents and constitute raw materials for the manufacture of traditional and modern medicines. Inspite of their huge bio-diversity, many of the potential herbs are yet not known to the scientific world. *Gloriosa superba* L. has now been listed as endangered species due to its overexploitation or over-collection. It has large pharmacological value due to presence of an important alkaloid, colchicine and also other biologically active compounds. So, the key challenges now lie in developing new conservation strategies so as to increase its germplasm base. Both *in situ* and *ex situ* conservation methods can be chosen depending on its distribution and as well as the availability of resources in the areas of its occurrence.

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16. Wild Apricot (*Prunus Armeniaca* L.):Source of Income Generation in Tehri, Uttarakhand

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ABSTRACT: Agricultural crops and food products have several unique characteristics, which set them apart from engineering materials, and these properties determine the quality of the fruit. In addition, the determination of physical properties of agricultural materials is important to design machines and processes for harvesting, handling and storage of these materials and requires understanding for converting these materials into food and feed. The calculations revealed that 100kg seeds extract 14 litres oil with the help of seed breaker as well as oil expeller. It is also compiled that total expenditure by including packaging cost and label cost from 100 kg seed worth Rs. 2014/-. During the survey it was observed that wild apricot fruits grown in Tehri district at various altitudes may help the local people to select important and good set of genotypes with better fruit quality performances for growing at orchard area under modern cultural practices.

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17. Medicinal uses of *Terminalia Arjuna* Roxb.: A Review

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ABSTRACT: Alternative medicines are getting popularized these days because of various advantages like less or nil side effects and most of them have therapeutic values. Using of plants with medicinal values for various human ailments is a best method in alternative medicine. Among various medicinal plants *Terminalia* species are known for their potential uses. Bark of *Terminalia arjuna* contains triterpenoids, tannins, phenolic acids, glycosides, antioxidants, magnesium, copper and zinc salts. Presence of these compounds plays an important role in curing cardiac diseases, cancer treatment, urinary tract infections, lung diseases and edema. From ancient days, arjuna bark powder is used in Ayurveda as a cardio tonic, indigestion and bleeding disorders. Arjuna helps in maintaining the cholesterol level at the normal rate. In rural areas bark powder of arjuna is used for snake bite and scorpion sting. Leaf juice of arjuna is used to cure dysentery and ear ache. Regular therapy with *Terminalia arjuna* bark powder leads to significant regression endothelial abnormalities among smokers. Hence, in the present review paper an attempt has been made to consolidate medicinal properties of *Terminalia* species.

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18. Role of Growth Regulators in Production of Essential Oils in Aromatic Crops

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ABSTRACT: The growth and development of aromatic plants, containing essential oil, may be influenced by many factors like genetic, climatic factors and agronomic practices. Among the different management practices, growth regulators influence the essential oil content in the aromatic crops. Most of the growth regulators like gibberellins, brassinolides, kinetins, NAA and CCC are most effective in improving quality of aromatic crops. Use of appropriate growth regulators at optimum concentration and right stage of the crop growth can increase the herbage and essential oil yield of aromatic crops.

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19. Varietal Performance of Turmeric (*Curcuma Longa* L.) under Southern Parts of Rajasthan

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ABSTRACT : Seven genotypes of turmeric (*Curcuma longa* L.) were evaluated under irrigated condition for two consecutive years at Fruit Research Station, Banswara (Rajasthan). The genotypes varied in their production potential, growth characters and curcumin content. Pooled data revealed that variety Suroma produced maximum plant height (134.17 cm), number of tillers per plant (5.39), single plant yield (0.431 kg) and yield per hectare of fresh rhizome (231.11 q/ha) and it was at par with the production of Roma (216.40 q/ha). These two varieties viz., Suroma and Roma were significantly superior among all the varieties during both the seasons and are suitable for general cultivation in the southern parts of Rajasthan, whereas, Pratibha variety exhibited highest curcumin content (3.12 g/100g) followed by Roma (2.69 g/100g).

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20. Swarna Suraksha: A New High yielding faba bean Variety

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ABSTRACT : Bihar State Varietal Release Committee (SVRC) recommended for release of first ever faba bean variety ' Swarna Suraksha' for its cultivation in across the state covering all agro-climatic zones. ICAR Research Complex for Eastern Region, Patna developed this faba bean variety. The newly developed variety 'Swarna Suraksha' is nutritionally superior over existing cultivar (s) and national check. It contains very less amount of anti-nutritional factor like tannin and phytate a major hurdle in the cultivation of such an excellent crop.

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2. Johnson, D.A. (1940). *Plant Microtechnique*. McGraw- Hill Publishing Co. Ltd., New York. PP-29
3. Kapil, R.N. and Arora, S. (1990). Some fascinating features of orchid pollen. *J. Orchid Soc.*, 4 (1): 9-28.
4. Rashid, S., Ashraf, M., Bibi, S. and Anjum, R. (2000). Antibacterial and antifungal activities of *Launaea nudicalulis* Roxb. and *Launaea resedifolia* L. *Pakistan J. Biol. Sci.*, 3 (4) :630-632.

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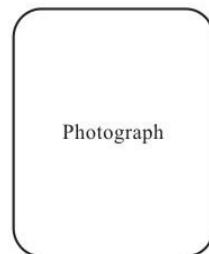
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